

**PATENT APPLICATION OF
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FOR
MULTI-FLUID APPLICATOR**

BACKGROUND-FIELD OF INVENTION

The present invention relates generally to an applicator with fluids sealed within it. More specifically, the present invention relates to an applicator with one or more fluids sealed separately within it with opening means enclosed within the applicator to allow the commingling and releasing of the fluids enclosed within the applicator.

BACKGROUND-DESCRIPTION OF RELATED ART

Applicators such as cotton swabs are generally used to apply medication, anesthetic, alcohol, and various other liquids. Swab applicator generally comprises of a tubular handle with a formed absorbent tip at one or both ends of the tubular handle. The absorbent tip may be made of cotton or a foam absorbent material. The tip may also be a brush. The tubular handle may be made of wood, paper, or plastic and it may be solid or hollow.

Generally the applicator tip of a dry swab applicator is first placed in contact with the liquid to be applied for the applicator tip to absorb the liquid. Subsequently, the moisturized applicator tip is placed in contact with the surface to apply the absorbed liquid to the surface. Swab applicators may also be pre-moistened with the desired liquid and sealed in a container for subsequent use. Generally the pre-moistened swab applicators are packaged individually so that opening the packaging to retrieve one swab applicator will not affect the remaining swab applicators.

SUMMARY OF THE INVENTION

The present invention is a multi-fluid applicator with one or more fluids sealed separately within it with opening means enclosed within the applicator to allow the commingling and releasing of the fluids enclosed within the applicator. The enclosed opening means may be operated by bending the applicator at or near the enclosed opening means. Once the enclosed opening means is opened, the fluids sealed within the elongated sealed container will commingle with each other and be released for application or may be released directly for application. There are no loose parts that may be lost and the fluids are completely sealed within the applicator.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a cross-sectional view of the preferred embodiment of the multi-fluid applicator.

Figure 2 shows a cross-sectional view of another embodiment of the multi-fluid applicator.

Figure 3 shows a cross-sectional view of another embodiment of the multi-fluid applicator.

Figure 4 shows a cross-sectional view of another embodiment of the multi-fluid applicator.

Figure 5 shows a cross-sectional view of another embodiment of the multi-fluid applicator.

Figure 6 shows a cross-sectional view of another embodiment of the multi-fluid applicator.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 shows a cross-sectional view of the preferred embodiment of the multi-fluid applicator. In the preferred embodiment, the multi-fluid applicator comprises of a first elongated tubular housing 1 with a sealed end 2 and an open end 3. A first fluid 4 is enclosed within the first elongated tubular housing 1.

A second elongated tubular housing 5 with a sealed end 6 and an open end 7 and with approximately the same outside diameter at a location near its sealed end 6 as the open end 3 of the first elongated tubular housing 1 is inserted with its sealed end 6 inside the open end 3 of the first elongated tubular housing 1 sealing the first fluid 4 within the first elongated tubular housing 1. A second fluid 8 is enclosed within the second elongated tubular housing 5. The second fluid 8 may be the same as or different than the first fluid 4. An opening means 9 in the form of a fracture line is located near the sealed end 6 of the second elongated tubular housing 5 and positioned within the first elongated tubular housing 1 such that the sealed end 6 of the second elongated tubular housing 5 will sever from the remainder of the second elongated

tubular housing 5 when the elongated tubular housings 1, 5 are bent near the fracture line to allow the first fluid 4 in the first elongated tubular housing 1 to commingle with the second fluid 8 in the second elongated tubular housing 5.

A viscous substance 10 such as silicone may be disposed near the open end 7 of the second elongated tubular housing 5 to seal the second fluid 8 within the second elongated tubular housing 5 and to prevent evaporation of the second fluid 8. After the opening means 9 is opened, the first fluid 4 will commingle with the second fluid 8 and the two fluids 4, 8 may be ejected from the applicator by squeezing the first elongated tubular housing 1 for application. An applicator tip 11 such as a cotton or foam swab or a brush may be affixed to the open end 7 of the second elongated tubular housing 5 to apply the ejected fluids 4, 8.

The open end 7 of the second elongated tubular housing 5 may also be sealed and provided with a second opening means such as a fracture line to allow complete sealing of the second fluid in the second elongated tubular housing 5. After the opening means 9 is opened, the first fluid 4 will commingle with the second fluid 8 and the two fluids 4, 8 may be ejected from the applicator by opening the second opening means and then squeezing the first elongated tubular housing 1 for application.

The first fluid 4 may also be omitted with the first elongated tubular housing 1 simply filled with air. The fluid sealed in the second elongated tubular housing 5 may be controllably released by first opening the opening means and then squeezing the first elongated tubular housing 1. The rate and amount of the fluid extracted may be controlled by the pressure applied to the first elongated tubular housing 1.

Furthermore, one of the fluids, such as the first fluid 4, may also be replaced with a powder substance wherein when the opening means 9 is opened the fluid in the applicator will

mix with the powder substance and subsequently be ejected for application. This is particularly suitable when the application requires that a powder substance be kept dry until application, at which time the dry powder must be mixed with a fluid such as an activating agent.

Another embodiment of the multi-fluid applicator is shown in figure 2. In this embodiment, the multi-fluid applicator comprises of an elongated tubular housing 21 with a sealed end 22 and an open end 23. A restriction 24 is disposed between the sealed end 22 and the open end 23 generally separating the elongated tubular housing 21 into two sections. A first fluid 25 is enclosed within the first section near the sealed end 22 of the elongated tubular housing 21. A second fluid 26 is enclosed within the second section near the open end 23 of the elongated tubular housing 21. The second fluid 26 may be the same as or different than the first fluid 25.

A first opening means in the form of a first elongated tube 27 with a sealed end 29 and an open end 30 and with approximately the same outside diameter as the restriction 24 of the elongated tubular housing 21 is inserted with its sealed end 29 inside the restriction 24 in the elongated tubular housing 21 sealing the first fluid 25 within the elongated tubular housing 21. A fracture line 28 is located near the sealed end 29 of the first elongated tube 27 such that the sealed end 29 of the first elongated tube 27 will sever from the remainder of the first elongated tube 27 when the elongated tubular housing 21 and the first elongated tube 27 are bent near the fracture line 28.

A second opening means in the form of a second elongated tube 31 with a sealed end 32 and an open end 33 and with approximately the same outside diameter at a location near its sealed end 32 as the open end 23 of the elongated tubular housing 21 is inserted with its sealed end 32 inside the open end 23 of the elongated tubular housing 21 sealing the second fluid 26

within the second section of the elongated tubular housing 21. A fracture line 34 is located near the sealed end 32 of the second elongated tube 31 such that the sealed end 32 of the second elongated tube 31 will sever from the remainder of the second elongated tube 31 when the elongated tubular housing 21 and the second elongated tube 31 are bent near the fracture line 34.

After the first opening means is opened, the first fluid 25 will commingle with the second fluid 26. The second opening means may subsequently be opened to allow extraction of the fluids 25, 26 from the applicator by squeezing the elongated tubular housing 21 for application. An applicator tip 35 such as a cotton or foam swab or a brush may be affixed to the open end 33 of the second elongated tube 31 to apply the extracted fluids 25, 26.

One of the fluids, such as the first fluid 25, may be replaced with a powder substance wherein when the first opening means is opened the fluid in the applicator will mix with the powder substance and subsequently be ejected for application. This is particularly suitable when the application requires that a powder substance be kept dry until application, at which time the dry powder must be mixed with a fluid such as an activating agent.

Yet another embodiment of the multi-fluid applicator is shown in figure 3. In this embodiment, the multi-fluid applicator comprises of an elongated tubular housing 40 with a sealed end 41 and an open end 42. A restriction 43 is disposed between the sealed end 41 and the open end 42 generally separating the elongated tubular housing 40 into two sections. A first fluid 44 is enclosed within the first section near the sealed end 41 of the elongated tubular housing 40. A second fluid 45 is enclosed within the second section near the open end 42 of the elongated tubular housing 40. The second fluid 45 may be the same as or different than the first fluid 44.

An opening means in the form of an elongated tube 46 with a sealed end 47 and an open end 48 is inserted with its sealed end 47 inside the restriction 43 in the elongated tubular housing 40 sealing the first fluid 44 and the second fluid 45 within the elongated tubular housing 40 and with approximately the same outside diameters located near the restriction 43 and the open end 42 as the restriction 43 and the open end 42 of the elongated tubular housing 40. A first fracture line 49 is located near the sealed end 47 disposed within the first section and a second fracture line 50 is located near the open end 42 of the elongated tubular housing 40 such that the elongated tube 46 will break open when the elongated tubular housing 40 and the elongated tube 46 are bent near the fracture lines 49, 50.

The opening means may be selectively opened to allow the first fluid 44, the second fluid 45, or both fluids 44, 45 to be released from the applicator by squeezing the elongated tubular housing 40 for application. An applicator tip 51 such as a cotton or foam swab or a brush may be affixed to the open end 48 of the elongated tube 46 to apply the extracted fluids 44, 45.

Yet another embodiment of the multi-fluid applicator is shown in figure 4. In this embodiment, the multi-fluid applicator comprises of an elongated tubular housing 60 with a sealed end 61 and an open end 62. A restriction 63 is disposed between the sealed end 61 and the open end 62 generally separating the elongated tubular housing 60 into two sections. A first fluid 64 is enclosed within the first section near the sealed end 61 of the elongated tubular housing 60. A second fluid 65 is enclosed within the second section near the open end 62 of the elongated tubular housing 60. The second fluid 65 may be the same as or different than the first fluid 64.

An opening means in the form of an elongated tube 66 with a sealed end 67 and an open end 68 is inserted with its sealed end 67 inside the restriction 63 in the elongated tubular housing

60 sealing the first fluid 64 and the second fluid 65 within the elongated tubular housing 60 and with approximately the same outside diameters located near the restriction 63 and the open end 62 as the restriction 63 and the open end 62 of the elongated tubular housing 60. A first fracture line 69 is located near the sealed end 61 and positioned such that when the elongated tube 66 is inserted inside the restriction 63 the first fracture line 69 will be inside the first section. A second fracture line 70 is located near the first fracture line 69 opposite the restriction 63. A third fracture line 71 is separated from the first 69 and second 70 fracture lines by a sealed-off section 72 of the elongated tube 66 located near the open end 62 of the elongated tubular housing 60. A third fluid 73 is enclosed by the sealed-off section 72 of the elongated tube 66. The third fluid 73 may be the same as or different than the other two fluids 64, 65. The elongated tube 66 will break open when the elongated tubular housing 60 and the elongated tube 66 are bent near the fracture lines 63, 70, 71.

The opening means may be opened to allow the three fluids 64, 65, 73 to be commingled and released from the applicator by squeezing the elongated tubular housing 60 for application. When the first fracture line 69 is broken, the first fluid 64 will commingle with the third fluid 73. When the second fracture line 70 is broken, the commingled first 64 and third 73 fluids will commingle with the second fluid 65. When the third fracture line 71 is broken, the commingled fluids 64, 65, 73 will be released from the applicator. An applicator tip 74 such as a cotton or foam swab or a brush may be affixed to the open end 68 of the elongated tube 66 to apply the extracted fluids 64, 65, 73.

One of the fluids, such as the first fluid 64, may be replaced with a powder substance wherein when the opening means are opened the fluid in the applicator will mix with the powder substance and subsequently be ejected for application. This is particularly suitable when the

application requires that a powder substance be kept dry until application, at which time the dry powder must be mixed with a fluid such as an activating agent.

Yet another embodiment of the multi-fluid applicator is shown in figure 5. In this embodiment, the multi-fluid applicator comprises of an elongated tubular housing 80 with a sealed end 81 and an open end 82. Multiple restrictions 83 are disposed between the sealed end 81 and the open end 82 generally separating the elongated tubular housing 80 into multiple sections. A fluid 84, 85, 86, 87 is enclosed within each of the sections of the elongated tubular housing 80. The fluids 84, 85, 86, 87 may all be the same fluid or different fluids may be used in each section.

An opening means in the form of an elongated tube 88 with a sealed end 89 and an open end 90 is inserted with its sealed end 89 through all the restrictions 83 in the elongated tubular housing 80 sealing each of the fluids 84, 85, 86, 87 in the respective sections in the elongated tubular housing 80 and with approximately the same outside diameters located near each of the restrictions 83 and the open end 82 as the restrictions 83 and the open end 82 of the elongated tubular housing 80. A fracture line 91 is located near each of the restrictions 83 disposed within each section such that the fluid 84, 85, 86, 87 within a section will be released when the fracture line 91 in that section is broken open when the elongated tubular housing 80 and the elongated tube 88 are bent near the fracture line 91.

The opening means may be selectively opened to allow the desired fluid to be released from the applicator by squeezing the section of the elongated tubular housing 80 with the fluid. An applicator tip 92 such as a cotton or foam swab or a brush may be affixed to the open end 90 of the elongated tube 88 to apply the extracted fluid.

Yet another embodiment of the multi-fluid applicator is shown in figure 6. In this embodiment, the multi-fluid applicator comprises of an elongated tubular housing 100 with a sealed end 101 and an open end 102. Multiple restrictions 103 are disposed between the sealed end 101 and the open end 102 generally separating the elongated tubular housing 100 into multiple sections. A fluid 104, 105, 106, 107 is enclosed within each of the sections of the elongated tubular housing 100. The fluids 104, 105, 106, 107 may all be the same fluid or different fluids may be used in each section.

An opening means in the form of an elongated tube 108 with a sealed end 109 affixed to the sealed end 101 of the elongated tubular housing 100 and an open end 110 that extends through all the restrictions 103 in the elongated tubular housing 100 sealing each of the fluids 104, 105, 106, 107 in the respective sections in the elongated tubular housing 100 and with approximately the same outside diameters located near each of the restrictions 103 and the open end 102 as the restrictions 103 and the open end 102 of the elongated tubular housing 100. A fracture line 111 is located near each of the restrictions 103 disposed within each section such that the fluid 104, 105, 106, 107 within a section will be released when the fracture line 111 in that section is broken open when the elongated tubular housing 100 and the elongated tube 108 are bent near the fracture line 111.

The opening means may be selectively opened to allow the desired fluid to be released from the applicator by squeezing the section of the elongated tubular housing 100 with the fluid. An applicator tip 112 such as a cotton or foam swab or a brush may be affixed to the open end 110 of the elongated tube 108 to apply the extracted fluid.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the

presently preferred embodiments of this invention. Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.